

specimen seems at least to make another link between the *Antheadæ* and *Bunodidæ*. The Anemone still lives in the possession of Mr. Mundie.

I have had to change my opinion about the quantities of *Aiptasiæ* around these islands. Their very great number soon made me think that I had been mistaken. I sent some specimens to Mr. Gosse, and he imagined them to be *Aiptasiæ*, but they did not recover the journey sufficiently for him to be sure about it. I have had no accommodation for them to disport themselves fully, and consequently I was misled by a general resemblance. I must conclude now, that though there are probably *Aiptasiæ* to be found here, yet they certainly do not exist in the numbers I imagined, but I have mistaken the grey *Antheæ* for them. I hope you will enter this in your 'Annals' as soon as possible, lest Anemone-fanciers should be tempted to our distant retreat by false hopes.

St. Mary's Parsonage, Isles of Scilly,
November 4, 1865.

Sincerely yours,
D. P. ALFORD.

On the Nest of the Ten-spined Stickleback.

By W. H. RANSOM, M.D.

Although it has long been known that the three-spined and fifteen-spined Sticklebacks build nests—the former on the ground, and the latter among weeds—no one has yet described, so far as I am aware*, the nest of the ten-spined Stickleback, or *Gasterosteus pungitius*, so common in our ditches, and well known by the name of Tinker, from the black nuptial livery of the male. I was fortunate enough, in 1854, to have a nest built by a little Tinker in my aquarium, and I found that its position resembled that of the fifteen-spined species. Last spring I was able more carefully to witness this interesting fact. On May 1st, 1864, a fine black male *G. pungitius* was put into a well-established aquarium of moderate size, in which he soon became at home, but did not build any nest for three days. I then supplied him with two ripe females of the same species. Their presence at once roused him to activity, and he soon began to build a nest of bits of dirt and dead fibre and of growing confervoid filaments, upon a jutting point of rock among some interlacing branches of *Myriophyllum spicatum*—all the time, however, frequently interrupting his labours to pay his addresses to the females. This was done in most vigorous fashion, the male fish swimming, by a series of rapid little jerks, near and about the female, and even pushing against her with open mouth, but usually not biting. After a little coquetting, if she be ripe, she responds and follows him, swimming just above him as he leads the way to the nest. When there, the tables are turned, the gentleman now coquets, he seems not to

* Since my paper was read, I have discovered that Mr. Charles Strange described the nest of the Tinker in 'Once a Week,' vol. i. p. 145. There is also a figure accompanying the communication, but that appears to be the nest of the three-spined Stickleback. Mr. Couch, in his 'History of British Fishes,' now in course of publication, remarks that he has never seen the nest of the Tinker.

know where it is, will not swim to the right spot, and the female, after a few ineffectual attempts to find the proper passage into it, turns tail to swim away, viciously chased this time by the male. When he first courts the female, if she, not being ready, does not soon respond, he seems quickly to lose temper, and, attacking her with great apparent fury, drives her to seek shelter in some crevice or dark corner. The coquetting of the male near the nest, which seems due to the fact that he really has not quite finished it, at length terminates by his pushing his head well into the entrance of the nest, while the female closely follows him, placing herself above him, and apparently much excited. As he withdraws she passes into the nest, and pushes quite through it, after a very brief delay, during which she deposits her ova. While she is in the nest, the male, in some impatience, pushes his snout against her tail, and as she passes through he also enters, fertilizes the ova, and then makes his exit at the opposite side. At once he proceeds seriously to attack the female and to drive her to a safe distance; then, after patting down his disturbed nest, away he goes in search of another female. In this case both the females spawned in his nest, and it is quite likely that more would have done so had I supplied them. The nest was built, and the ova deposited, in about twenty-four hours.

My Tinker continued to watch day and night; and during the light hours he also continued to add to his nest, which at first was a rather hurried and imperfect structure. After eight days I put a ripe female three-spined Stickleback into the tank with him. At once he paid court to her, and solicited her most palpably to accompany him to the nest; this, however, she obstinately refused, and he drove her away in real anger. During the night following she deposited her ova in another part of the tank among the weeds. This unwillingness of the female seems to be the sole cause of our finding no hybrids naturally, as artificially it is not difficult to get a cross between *G. leiurus* and *G. pungitius*. As the time approached for the eggs within the nest to hatch, the Tinker was even more constant in his attention to it. About the tenth day, before I could see any young Sticklebacks, he began, by mistake, to catch some young Perch, which just then were hatched in the same tank, and to project them into his nest. In order to be quite sure, I took some young Perch from another batch in a dish with a pipette, and put them into the tank near his nest. I saw him at once seize them, put them into his nest, and fan them afterwards with great apparent affection; this attention was, however, not appreciated; for the fry of the Perch are very erratic and wandering in their habits, and they swam out immediately with a skipping sort of motion. About the twelfth day young Sticklebacks were visible, but they seemed quite still, resting here and there upon the fibres of which the nest was built; none of them, as yet, seemed to have any errant desires, and not one of them wandered or gave their anxious parent any real trouble. About this time the Tinker was occasionally seen to visit and to inspect rather frequently another spot in the tank; and on the following day (the 14th) he began there to build another nest, this time free from any rockwork, and just in the middle of the

tank, where a few branches of *Myriophyllum*, *Chara*, and *Anacharis* crossed each other; these he connected by an accumulation of inter-laced, decayed, and growing fibres of confervæ, which he broke off or collected from neighbouring parts. When the fibres were added to the nest, he generally pushed them into the nest with his snout, but did not, so far as I could see, agglutinate them with a viscid secretion, such as I have seen the three-spined Stickleback do. When he brought bits of dirt, he was content to project them into or upon the mass of fibres which formed the nest. By dint of great industry, in about forty-eight hours he built a large well-formed nest, about the size and shape of a full-sized walnut, with a central aperture passing almost but at first not quite through it, in a direction nearly horizontal. During all this time he never interrupted his labours for, and care of, the young fry in his first nest, but continued both to catch the young Perch, and to watch and fan the nest; and after a few days he had to catch and bring back his own young ones when they began to wander. About this time his labours were incessant during the light hours; and although he seemed to take no food, he looked well. I then (the fifteenth day) put two ripe female ten-spined Sticklebacks into the tank; he courted them with great vigour; but as they did not respond, he drove them into the most distant and obscure corners with great ferocity: he then set to work with greater vigour than ever to enlarge and beautify his nest, and in the course of the following day the females deposited their ova in it so that they were easily seen, from the favourable position of the nest with regard to light. For three days more he continued his care of both nests, and caught indiscriminately young Perch and young Sticklebacks and put them indifferently into either nest. By the eighteenth day from the deposition of the ova in the first nest, and the sixth after hatching, the Stickleback fry were independent, and roamed in search of food; and from this date the parent took no more notice of them. I neglected to note whether the ova deposited in the second nest hatched safely; but I have reason to think that they did, as about a fortnight later I saw some very young Sticklebacks in the tank. This instance of the failure of instinct is remarkable, as the Tinker was almost starving in the midst of plenty. I am not aware that anyone has hitherto noticed the simultaneous building and tending of two nests by any of the *Gasterostei*; it would be interesting to ascertain if this be an exceptional fact, or limited to the ten-spined species. One would hardly expect it among the three-spined Sticklebacks, as they can and do enlarge their nests very considerably, so as in the nest of one male to receive, fertilize, and protect the spawn of several females. It is well known that the female Sticklebacks spawn more than once in a season; but it is not known, so far as I have read, how many times they spawn, nor how many times the males build; there will probably be a relation between the two. The observation here given shows at least two consecutive generations. This repeated ripening of ova in one season is doubtless connected with their large comparative size, and their consequent small number, as compared with those of other osseous fishes.—*Transactions of the Midland Scientific Association.*